






Limiting-current sensor for the determination of the lambda-value of a gas mixture**Publication number:** JP8506666T**Publication date:** 1996-07-16**Inventor:****Applicant:****Classification:****- international:** **G01N27/41; G01N27/419; G01N27/41; G01N27/417;**
(IPC1-7): G01N27/41; G01N27/41**- European:** G01N27/419**Application number:** JP19940515328T 19941124**Priority number(s):** WO1994DE01388 19941124; DE19934341278
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Proposed is a limiting-current sensor for determining the lambda-value of gas mixtures, in particular the exhaust gases from internal-combustion engines. The sensor has, mounted on an oxygen-ion-conducting solid electrolyte, a first electrolytic pump cell (14) and a second electrolytic pump cell (15), each having a first cathode (12) and a second cathode (13) which are exposed to the gas to be analysed in a diffusion barrier (20). The pump cells (14 and 15) are designed in such a way that, at the same external oxygen concentration, different pump currents (I_p) are established so that, at an oxygen concentration which is at least near that of a stoichiometric gas mixture ($\lambda = 1$), the pump cell (14) with the higher current (I_p) is activated while, at an oxygen concentration outside this range, the pump cell (15) with the lower current (I_p) is operating. To this end, the cathodes (12, 13) are located, spaced apart, with different diffusion paths 11 and 12 along the diffusion barrier (20), the first cathode (12) of the pump cell (14) which is operating when the gas mixture is near-stoichiometric ($\lambda = 1$) having a shorter diffusion path (11) than the second cathode (13) of the other pump cell (15).

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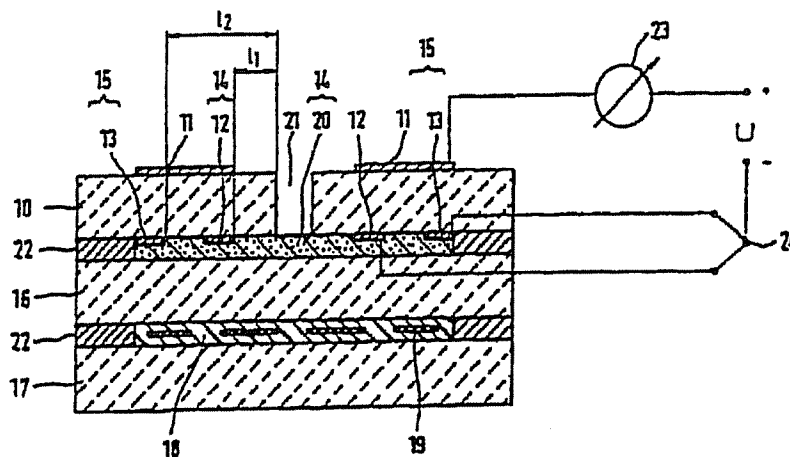
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(54) Limiting-current sensor for the determination of the lambda-value of a gas mixture

(57) Proposed is a limiting-current sensor for determining the lambda-value of gas mixtures, in particular the exhaust gases from internal-combustion engines. The sensor has, mounted on an oxygen-ion-conducting solid electrolyte, a first electrolytic pump cell (14) and a second electrolytic pump cell (15), each having a first cathode (12) and a second cathode (13) which are exposed to the gas to be analysed in a diffusion barrier (20). The pump cells (14 and 15) are designed in such a way that, at the same external oxygen concentration, different pump currents (I_p) are established so that, at an oxygen concentration which is at least near that of a stoichiometric gas mixture ($\lambda = 1$), the pump cell (14) with the higher current (I_p) is activated while, at an oxygen concentration outside this range, the pump cell (15) with the lower current (I_p) is operating. To this end, the cathodes (12, 13) are located, spaced apart, with different diffusion paths l_1 and l_2 along the diffusion barrier (20), the first cathode (12) of the pump cell (14) which is operating when the gas mixture is near-stoichiometric ($\lambda = 1$) having a shorter diffusion path (l_1) than the second cathode (13) of the other pump cell (15).



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